Red Ray Rot

Difficult to detect in living trees

Pathogen—The fungus *Dichomitus squalens* (= *Polyporus anceps*) causes red ray rot, sometimes known as red rot.

Hosts—The hosts include ponderosa and pinyon pine. This decay is common on ponderosa pine in the Black Hills.

Signs and Symptoms—*Dichomitus squalens* rarely produces a flat, annual fruiting body on the underside of dead branches or stems with intact bark (fig. 1). The pore surface is white when fresh and ages to yellow. The indicators of decay are difficult to identify on standing trees and include decayed branch stubs and fruiting on downed branches. The fungus causes a white pocket rot. Like other wood decays, it has two distinct stages: incipient and advanced.

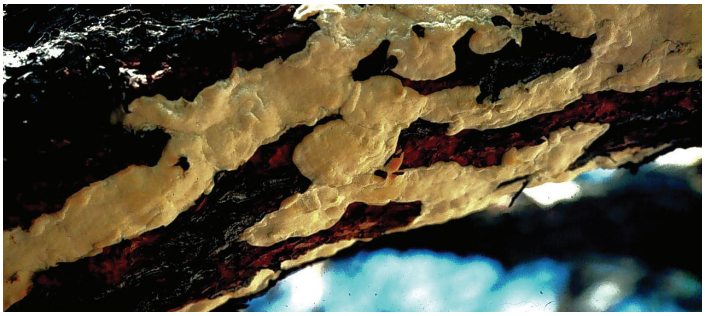

Figure 1. Conks of *Dichomitus squalens* underneath a dead ponderosa pine branch. *Photo: Southwestern Region, USDA Forest Service.*

Figure 2. Decay caused by *Dichomitus squalens* in old growth ponderosa pine. *Photo: Jim Worrall, USDA Forest Service*

The incipient stage is characterized by a reddish brown discoloration of the affected wood, with no obvious changes in structure or strength. The advanced stage includes a radial pattern of stain and decay (fig.2). This is characterized by small, often poorly defined, white pockets in the discolored wood, accompanied by progressive changes in structure and reduction in strength. As decay progresses, the pockets become more and more numerous until they merge and give the affected wood the appearance of a fibrous white mass (fig. 3). Eventually, the white, lint-like material disappears, leaving the bleached, grayish brown, decayed wood in either a stringy or a somewhat amorphous condition.

Both stages of red ray rot are usually visible in a board sawed from a decayed log. At the point where rot started in the trunk heartwood, advanced decay often forms a cavity. Extending in both directions from this point are more or less continuous columns of advanced decay, bordered by incipient decay.

Disease Cycle—The spores are dispersed by wind, land in cracked bark crevices of dead branches, and germinate to colonize the area between the bark and wood and eventually the heartwood. The fungus fruits abundantly on the lower side of decaying dead material in close contact with the ground. The flat, white fruiting bodies appear about 4 years after infection and then develop annually during the rainy season for about 6 years.

Impact—*Dichomitus squalens* is the most common decayer of ponderosa pine in the Black Hills. It has been found in Colorado, but seems to be relatively rare there. It is a decayer of slash (a saprobe) as well as a decayer of live trees.

Figure 3. Decay caused by *Dichomitus squalens* in a branch. *Photo: Jim Worrall, USDA Forest Service.*

It causes a significant amount of cull in live trees greater than 150 years old. Red ray rot may provide habitat for cavity nesting birds and other wildlife.

Management—Timber volume loss caused by red ray rot can be considerable. Reducing tree wounds might reduce the probability of infection, but this fungus can enter through dead branches. Trees infected by this fungus should be marked for removal to improve the residual stand and to release healthy trees, if consistent with the project guidelines.

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1. Gilbertson, R.L. 1974. Fungi that decay ponderosa pine. Tucson: University of Arizona Press. 197 p.

2. Gilbertson, R.L.; Ryvarden, L. 1986. North American polypores. Volumes 1 and 2. Oslo, Norway: Fungiflora. 885 p.

3. Sinclair, W.A.; Lyon, H.H.; Johnson, W.T. 1987. Diseases of trees and shrubs. Ithaca, NY: Cornell University Press. 574 p.